

FIG. 1

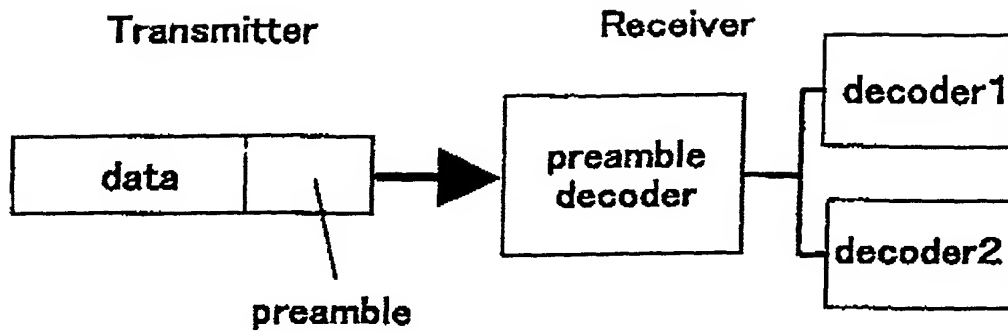


FIG. 2

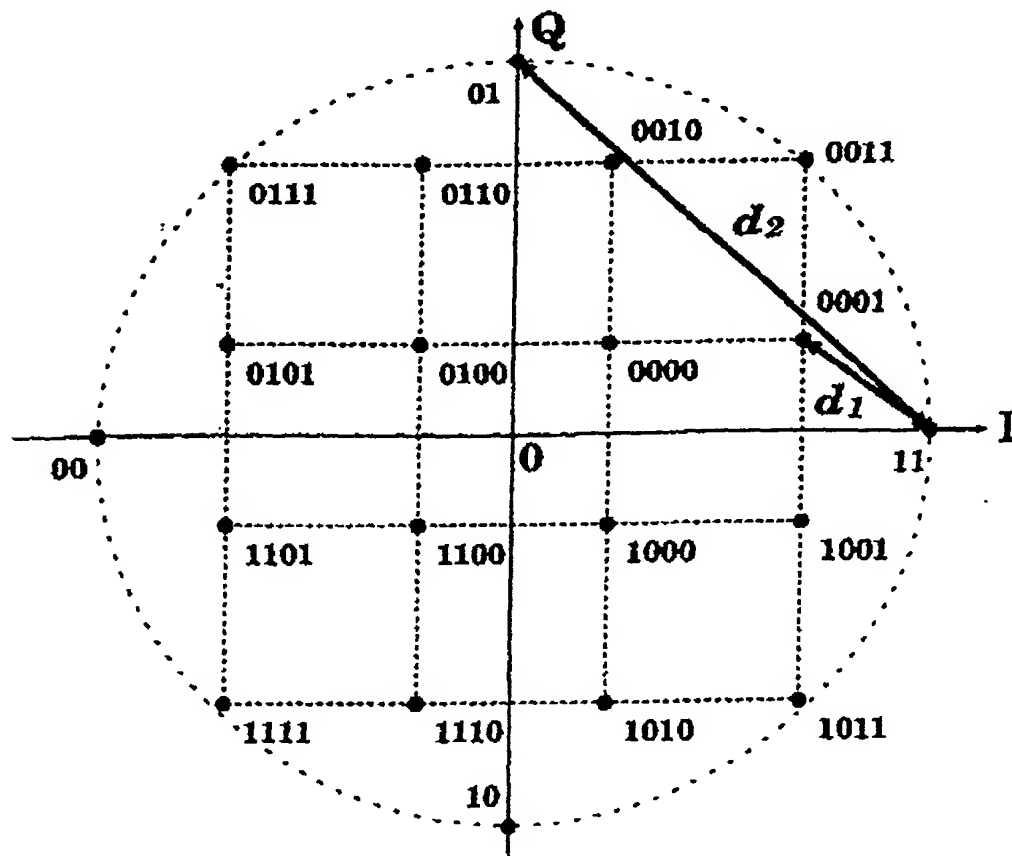
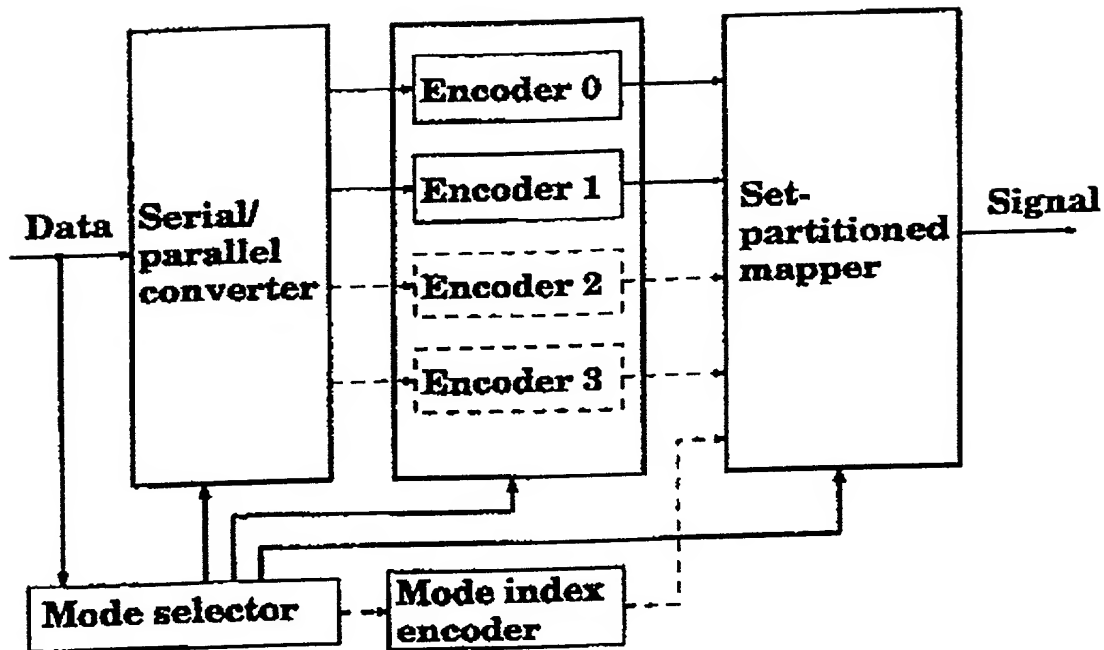
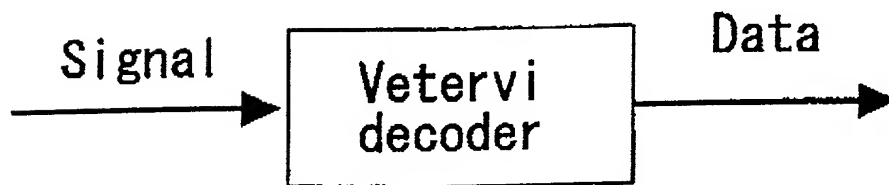


FIG. 3



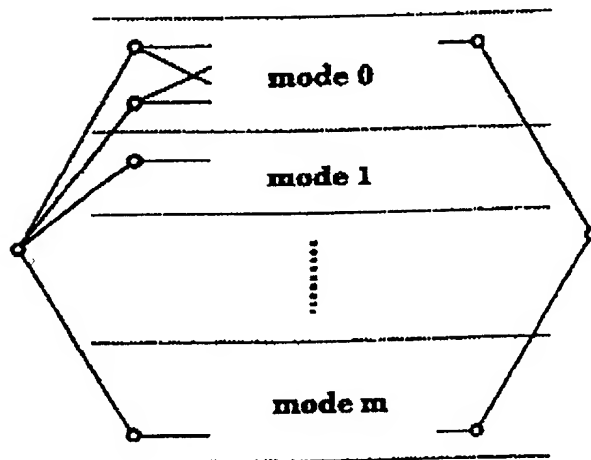
MULTI-MODE ENCODER

FIG. 4(a)



block diagram

FIG. 4(b)



trellis diagram

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FIG. 5

	$\overline{s1}$	$\overline{s2}$		$\overline{s(L-1)}$	$\overline{sL}$
<i>l1</i>	$\overline{c_1}$	$\overline{c_1}$		$\overline{c_1}$	$\overline{c_1}$
<i>l2</i>	$a_1$	$a_2$	-----	$a_{L-1}$	$c_2$
<i>l3</i>	$a_L$	$a_{L+1}$		$a_{2L-2}$	$a_{2L-1}$
<i>l4</i>	$\overline{a_{2L}}$	$\overline{a_{2L+1}}$		$\overline{a_{3L-2}}$	$\overline{a_{3L-1}}$

$$c_1 = 0 \text{ (mode 1), } 1 \text{ (mode 2)}$$

$$c_2 = a_1 \oplus a_2 \oplus \text{-----} \oplus a_{L-1}$$

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FIG. 6

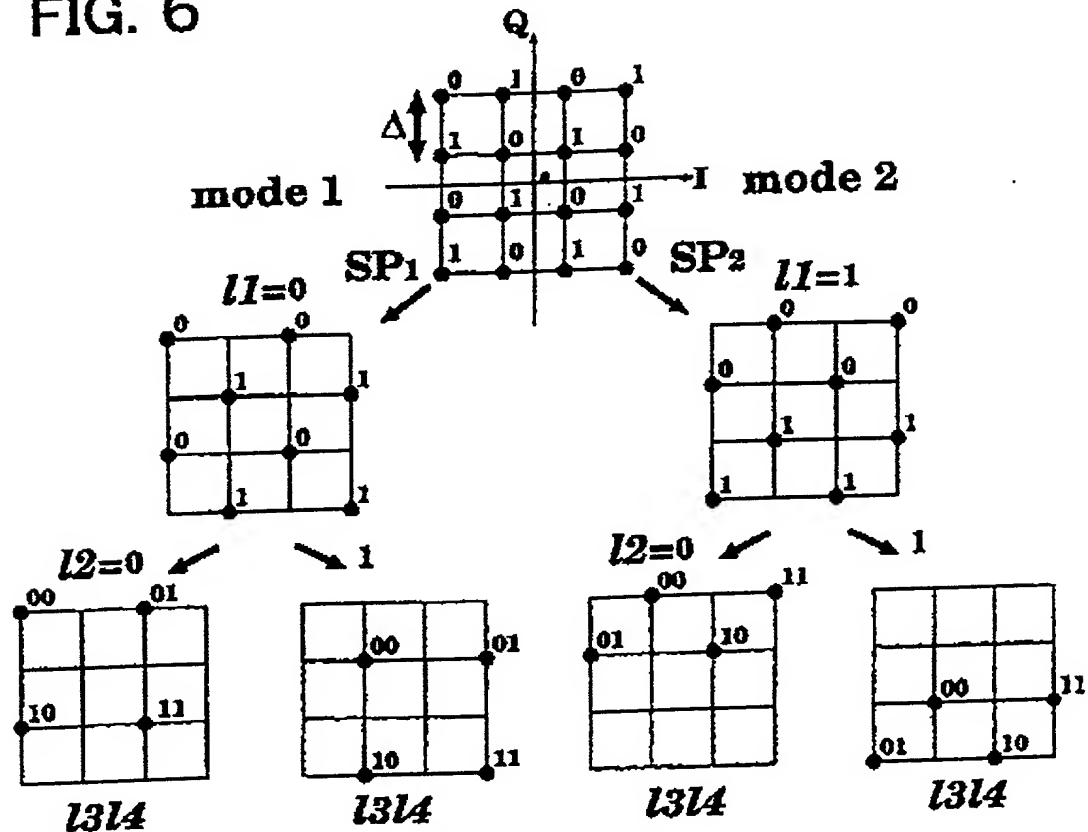


FIG. 7

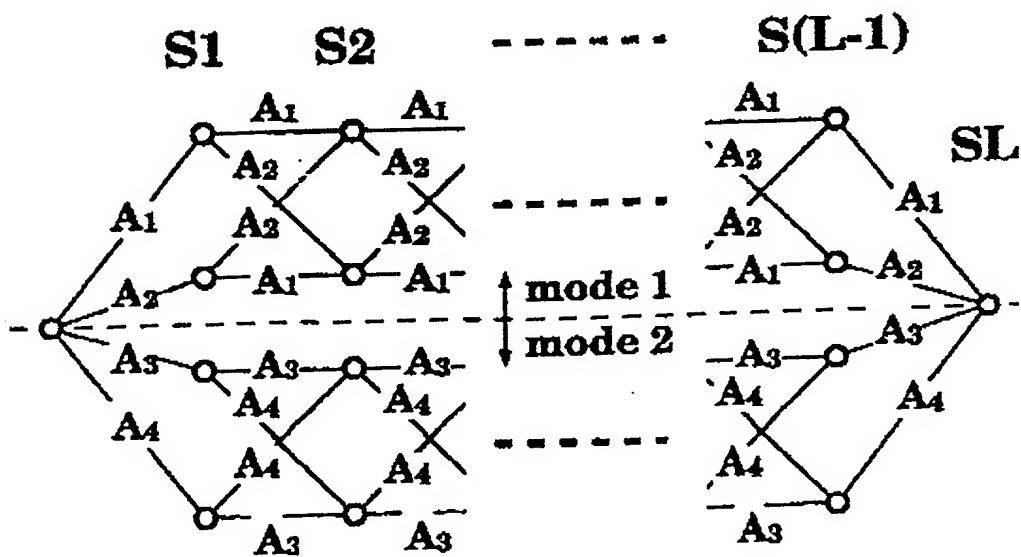


FIG. 8

$$\begin{array}{ccccccc}
 & \overline{s1} & & \overline{sL'} & \overline{s(L'+1)} & & \overline{s2L'} \quad \overline{s(2L'+1)} \quad \overline{s(L-1)} \quad \overline{sL} \\
 l1 & \overline{0} & & \overline{0} & \overline{0} & & \overline{0} \quad \overline{0} \\
 l2 & \overline{a_1} & \cdots & \overline{a_{L'}} & \overline{a_{L'+1}} & \cdots & \overline{a_{2L'}} \quad \overline{a_{2L'+1}} \quad \cdots \quad \overline{a_{3L'-1}} \quad \overline{c_1} \\
 l3 & \overline{a_{3L'}} & & \overline{a_{4L'-1}} & \overline{a_{4L'}} & & \overline{a_{5L'-1}} \quad \overline{a_{5L'}} & \overline{a_{6L'-2}} \quad \overline{a_{6L'-1}} \\
 l4 & \overline{a_{6L'}} & & \overline{a_{7L'-1}} & \overline{a_{7L'}} & & \overline{a_{8L'-1}} \quad \overline{a_{8L'}} & \overline{a_{9L'-2}} \quad \overline{a_{9L'-1}}
 \end{array}$$

mode 1

$$\begin{array}{ccccccc}
 l1 & \overline{0} & & \overline{0} & \overline{1} & & \overline{1} \quad \overline{1} \\
 l2 & \overline{a_1} & \cdots & \overline{a_{L'}} & \overline{a_{L'+1}} & \cdots & \overline{a_{2L'}} \quad \overline{a_{2L'+1}} \quad \cdots \quad \overline{a_{3L'-1}} \quad \overline{c_1} \\
 l3 & \overline{a_{3L'}} & & \overline{a_{4L'-1}} & \overline{a_{4L'}} & & \overline{a_{5L'-1}} \quad \overline{a_{5L'}} & \overline{a_{6L'-2}} \quad \overline{c_2} \\
 l4 & \overline{a_{6L'-1}} & & \overline{a_{7L'-2}} & \overline{a_{7L'-1}} & & \overline{a_{8L'-2}} \quad \overline{a_{8L'-1}} & \overline{a_{9L'-3}} \quad \overline{c_3}
 \end{array}$$

mode 2

$$\begin{array}{ccccccc}
 l1 & \overline{1} & & \overline{1} & \overline{0} & & \overline{0} \quad \overline{1} \\
 l2 & \overline{a_1} & \cdots & \overline{a_{L'}} & \overline{a_{L'+1}} & \cdots & \overline{a_{2L'}} \quad \overline{a_{2L'+1}} \quad \cdots \quad \overline{a_{3L'-1}} \quad \overline{a_{3L'}} \\
 l3 & & & & & & & \\
 l4 & & & & & & & 
 \end{array}$$

mode 3

$$\begin{array}{ccccccc}
 l1 & \overline{1} & & \overline{1} & \overline{1} & & \overline{1} \quad \overline{0} \\
 l2 & \overline{a_1} & \cdots & \overline{a_{L'}} & \overline{a_{L'+1}} & \cdots & \overline{a_{2L'}} \quad \overline{a_{2L'+1}} \quad \cdots \quad \overline{a_{3L'-1}} \quad \overline{c_1} \\
 l3 & & & & & & & \\
 l4 & & & & & & & 
 \end{array}$$

mode 4

$$\begin{aligned}
 c_1 &= a_1 \oplus a_2 \oplus \cdots \oplus a_{3L'-2} \oplus a_{3L'-1} \\
 c_2 &= a_{3L'} \oplus a_{3L'+1} \oplus \cdots \oplus a_{6L'-3} \oplus a_{6L'-2} \\
 c_3 &= a_{6L'-1} \oplus a_{6L'} \oplus \cdots \oplus a_{9L'-4} \oplus a_{9L'-3}
 \end{aligned}$$

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FIG. 9 (a)

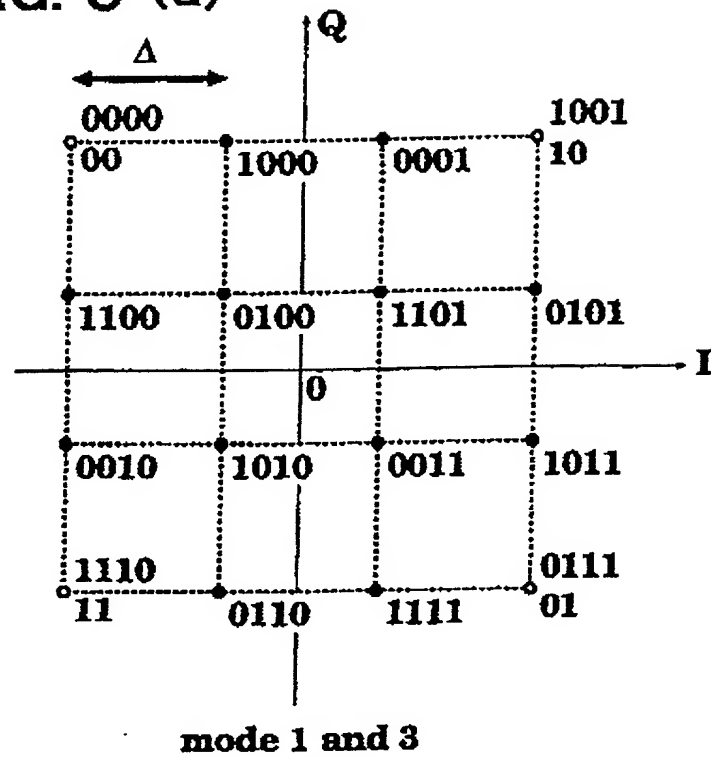
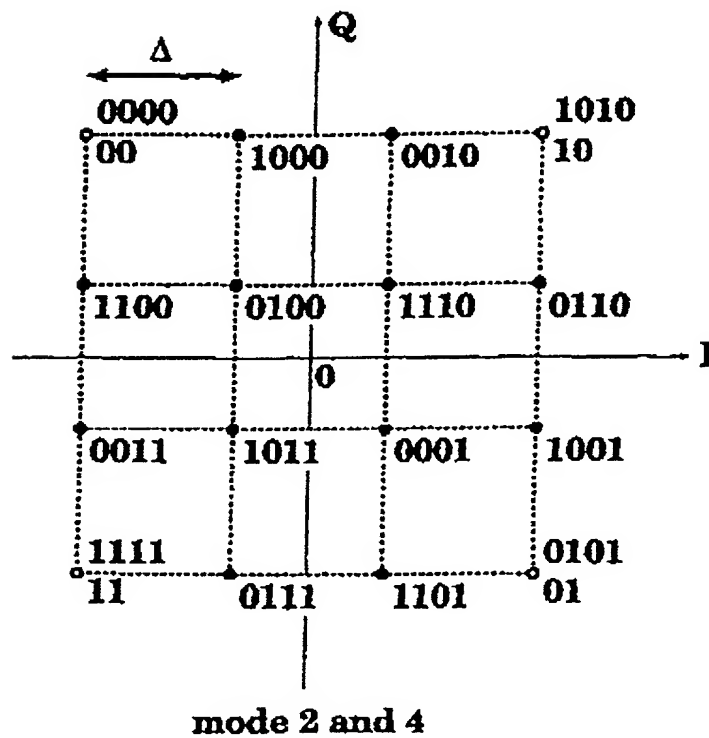
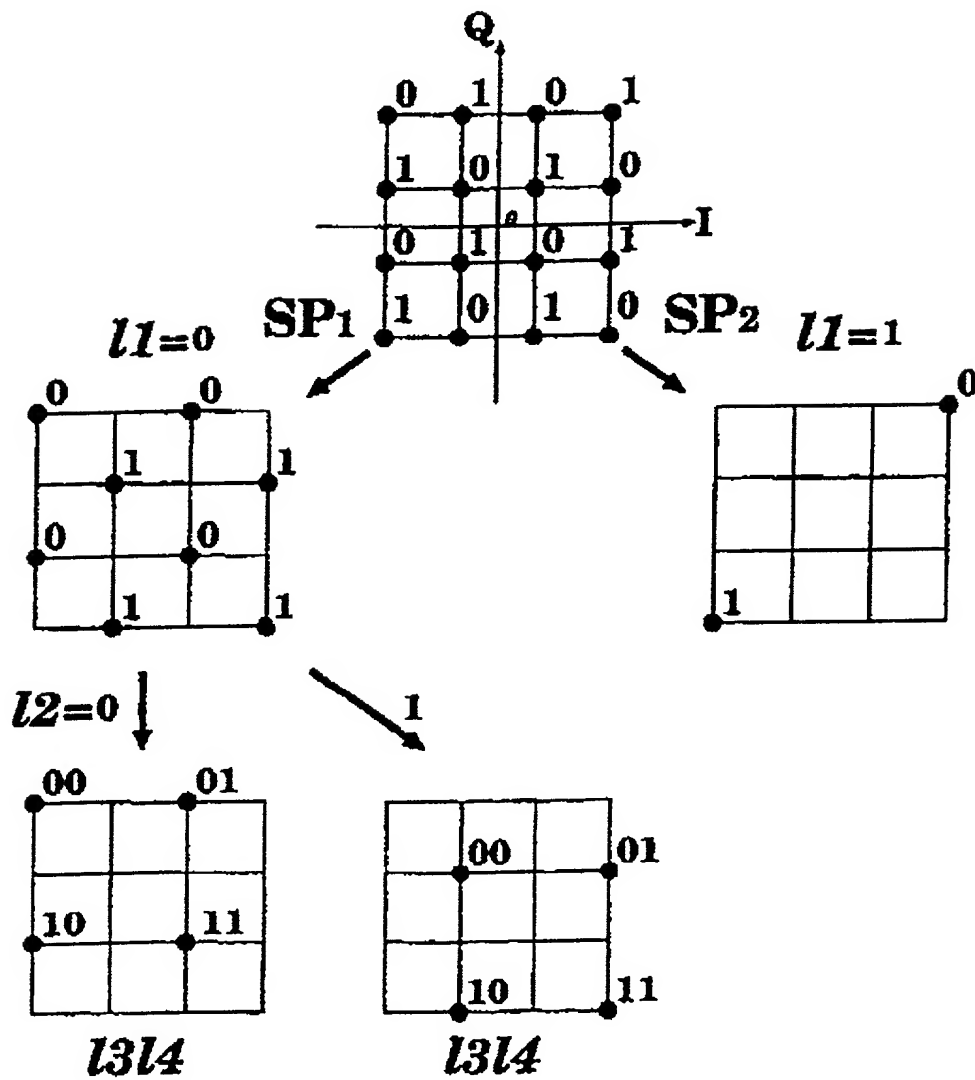


FIG. 9 (b)



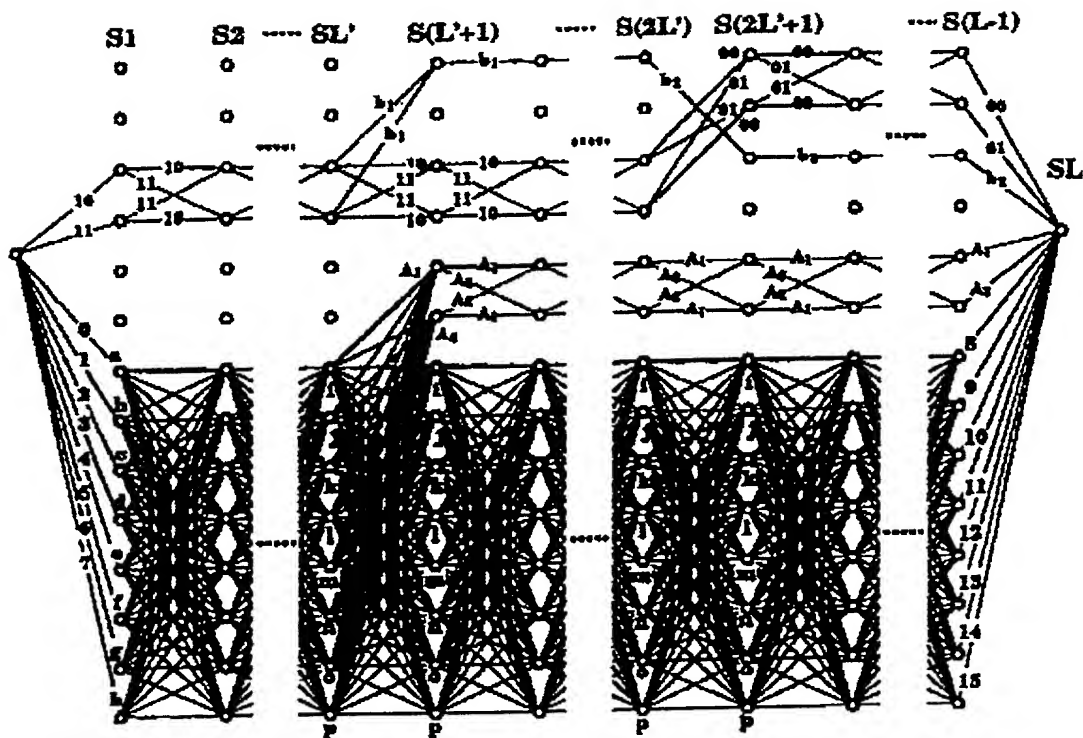
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[illegible]



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FIG. 11



		Si							
		a	b	c	d	e	f	g	h
$S(i-1)$	a	0	1	2	3	4	5	6	7
	b	1	0	3	2	5	4	7	6
	c	2	3	0	1	6	7	4	5
	d	3	2	1	0	7	6	5	4
	e	4	5	6	7	0	1	2	3
	f	5	4	7	6	1	0	3	2
	g	6	7	4	5	2	3	0	1
	h	7	6	5	4	3	2	1	0

		Si							
		i	j	k	l	m	n	o	p
$S(i-1)$	i	8	9	10	11	12	13	14	15
	j	9	8	11	10	13	12	15	14
	k	10	11	8	9	14	15	12	13
	l	11	10	9	8	15	14	13	12
	m	12	13	14	15	8	9	10	11
	n	13	12	15	14	9	8	11	10
	o	14	15	12	13	10	11	8	9
	p	15	14	13	12	11	10	9	8

FIG. 12

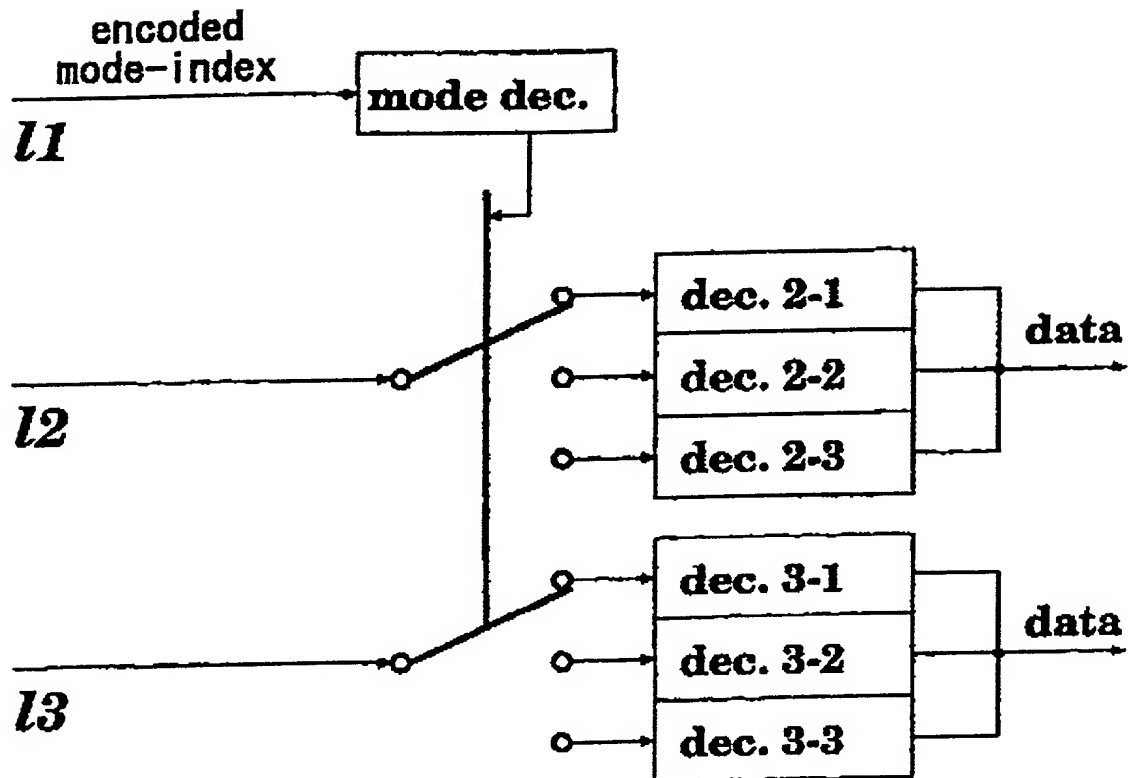


FIG. 13 (a)

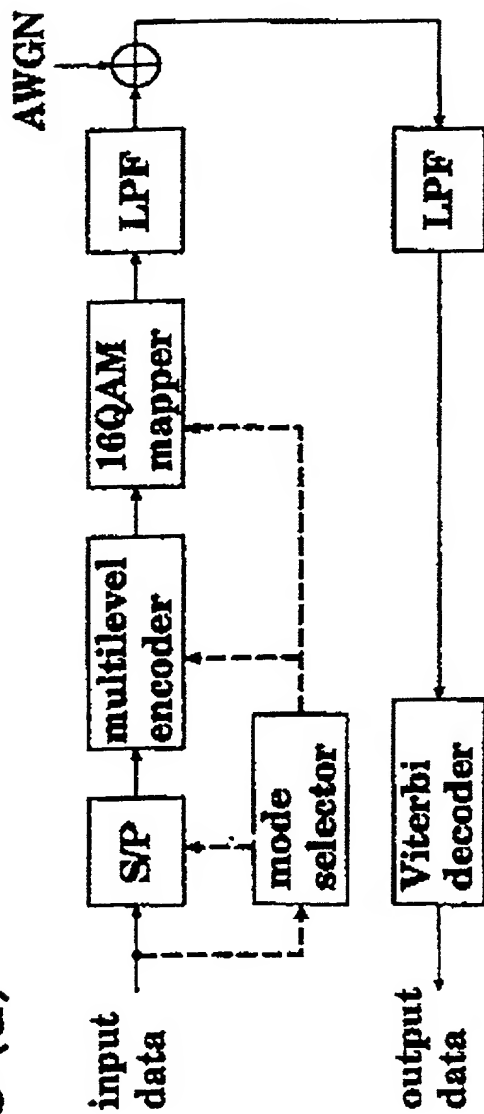


FIG. 13 (b)

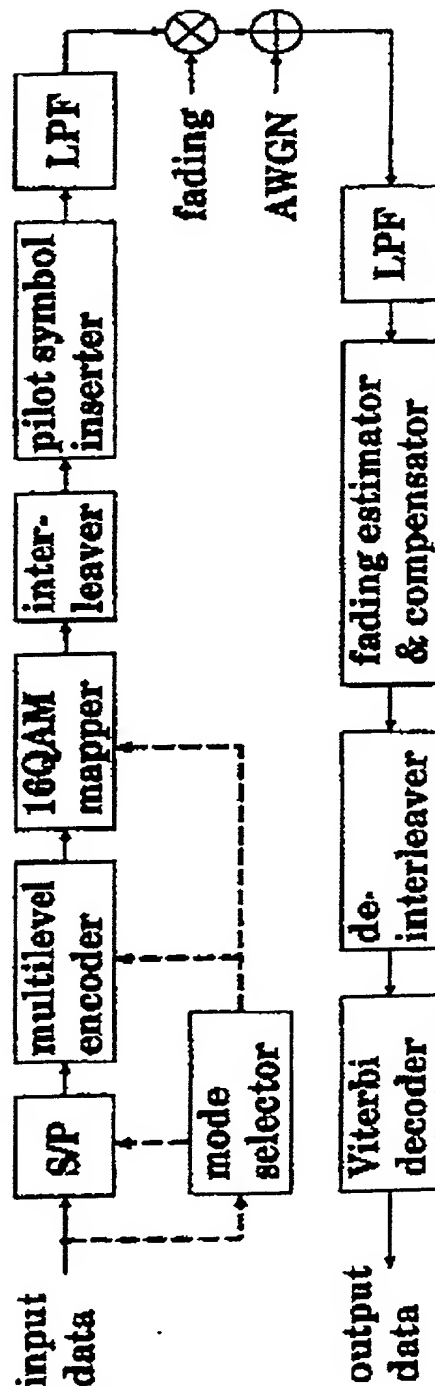
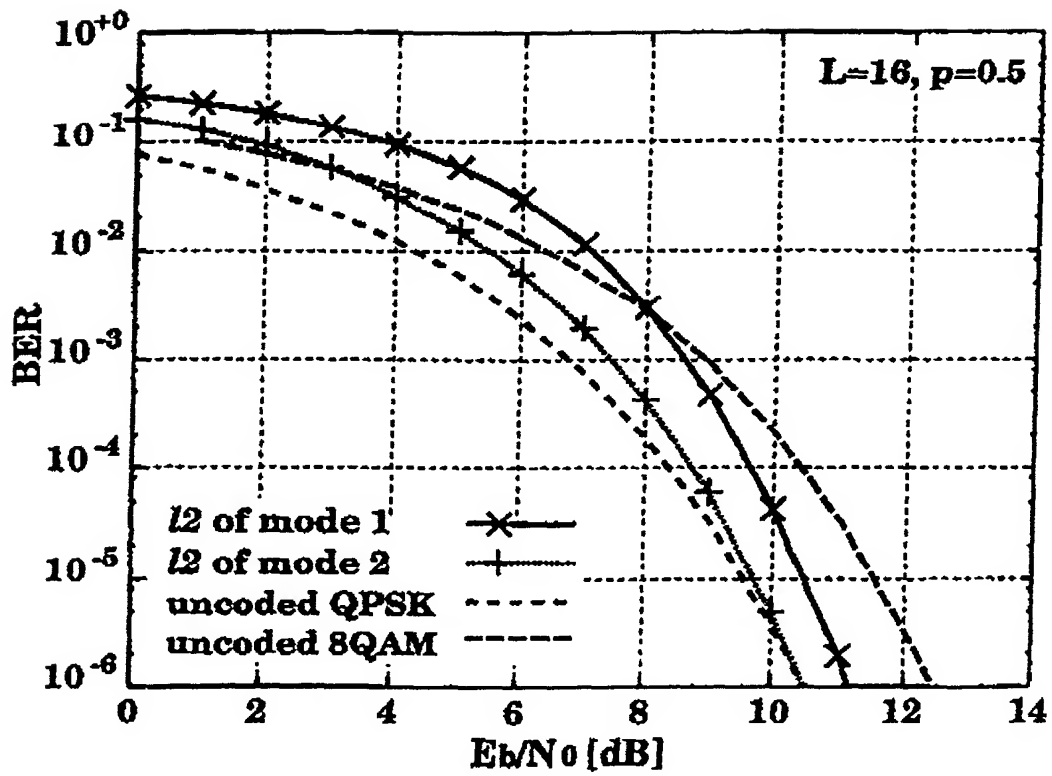


FIG. 14



1. The first thing I did was to go to the bank and get some money out of the machine. I was a bit nervous at first, but I managed to do it. I then went to the post office and sent a letter to my mother. I was a bit nervous at first, but I managed to do it. I then went to the bank and got some money out of the machine. I was a bit nervous at first, but I managed to do it.

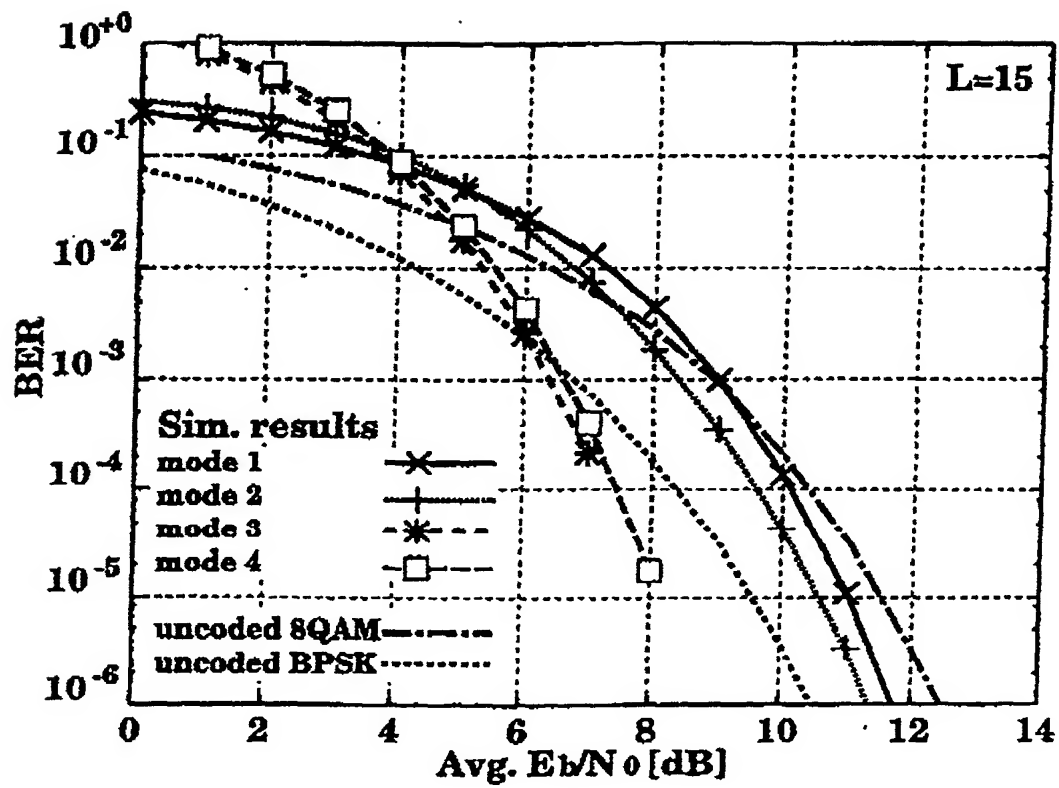


FIG. 16

